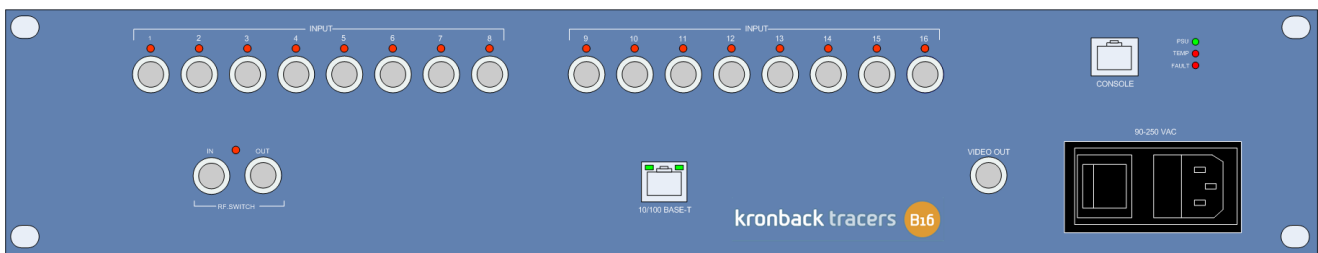


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Configuration and Operation manual



Kronback tracers B16

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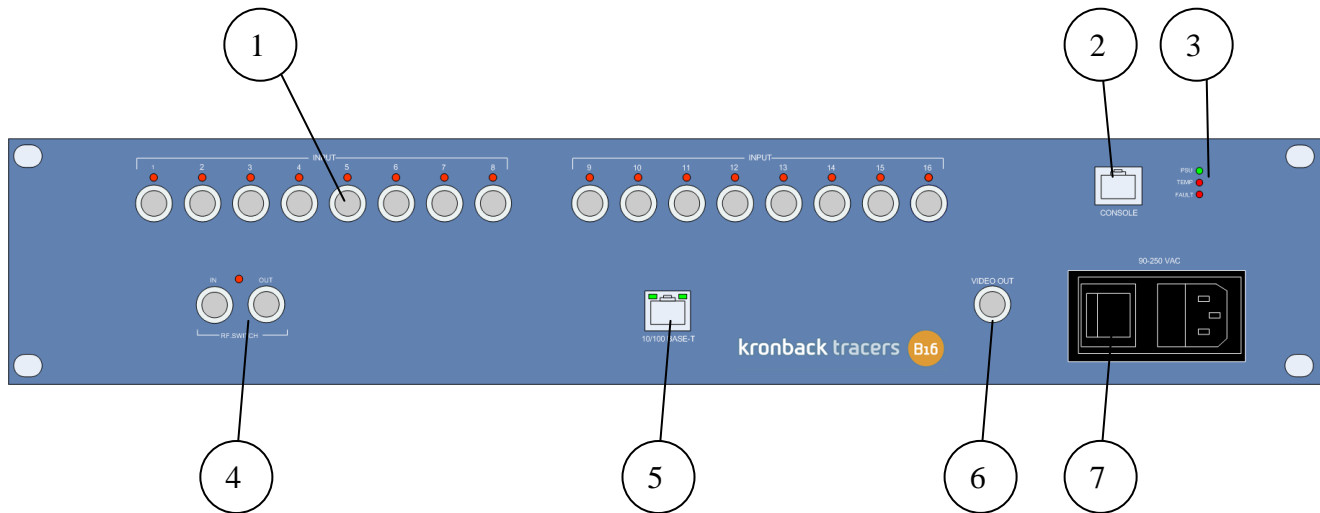
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1. Physical connections

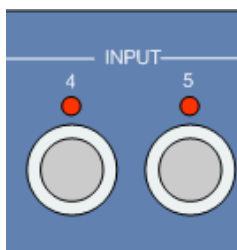


- 1 INPUT CONNECTOR AND LED
- 2 CONSOLE INTERFACE
- 3 STATUS LED
- 4 RF-SWITCH
- 5 NETWORK CONNECTOR
- 6 VIDEO OUT
- 7 POWER INLET

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1.1. Input connector and LED



The 16 F-type inputs connectors are mechanically fixed in the chassis front by a double D-cut hole.

The connectors can withstand torques > 4,5 Nm (40 lb*inch)

Maximum input level within the **B16** is 100dBuV.

Over each connector is a red LED that indicates which of the 16 input connectors that are active. Only one connector can be active at a time.

All input connectors are DC blocked up to 10V

All F-connectors are high quality CABLECON type.

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1.2. Console connector



The console interface is used for configuring the basic IP parameters of the **B16**, and to verify or change user credentials. The connector is a standard RJ45 type.

1.2.1. RS232 parameters

RS232 parameter	Value
Baud rate	9600 bps
Databits	8
Parity	None
Stop bit	1
Flow control	None

1.2.2. Connector pinout

pin	function
1	NC
2	NC
3	B16 data TX
4	ground
5	ground
6	B16 data RX
7	Programming use, connect to ground
8	Programming use, connect to ground

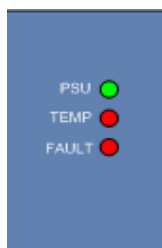
1.2.3. Console cable pinout

B16 RJ45 pin	direction	PC RS232 dsub9 female	Function
3	→	2	B16 data TX
4		5	ground
5		5	ground
6	←	3	B16 data RX
7		5	ground
8		5	ground

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1.3. Status LEDs



3 Status LEDs are present on the B16 front.

1.3.1. PSU LED

Is directly connected to the **B16** PSU. This LED must always be on.

1.3.2. TEMP LED

This LED lights if the internal temperature of B16 reaches 60 degrees.

1.3.3. FAULT LED

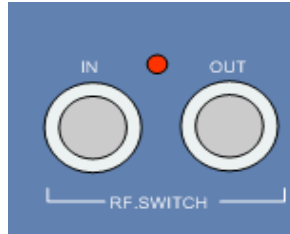
This indicates that the internal watch dog circuit is not being triggered. This indicates a CPU fault.

During power up this LED blinks 2-3 times

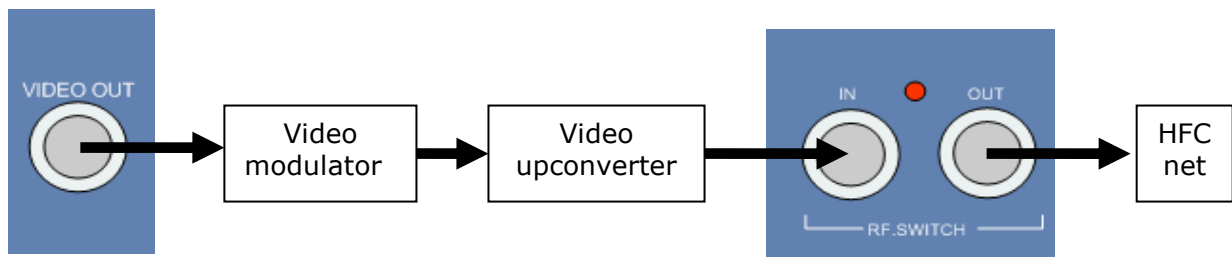
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1.4. RF-SWITCH



The RF-switch is controlled from the **SETUP→TV-OUT** menu in the **B16** user interface. It is intended for switching on and off the RF TV-OUT signal after it has been modulated and upconverted to a downstream TV frequency.



The RF-switch covers the frequency range up to 1GHz.
Both input and output are DC blocked up to 10V

The red LED between the connectors indicates that the switch is passing the signal on the input connector to the output connector.

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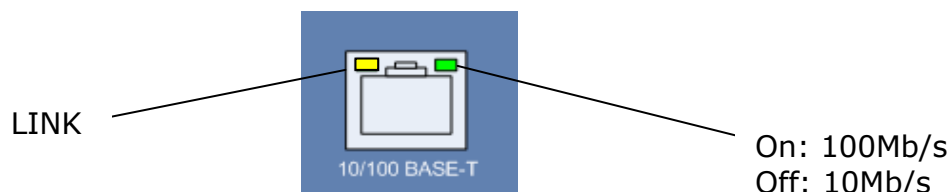
1.5. Network Connector



The RJ45 Network connector is supporting 10 or 100 Mbit/s link speed, and half or full duplex.
MDIX is supported for both straight and crossed twisted-pair cables.

1.5.1. LED indicators

The top left LED (yellow) indicates that LINK is established
The top right LED (green) when lighting indicates that Link Speed is 100Mb/s
The top right LED (green) when off indicates that Link Speed is 10Mb/s



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1.6. Video Out

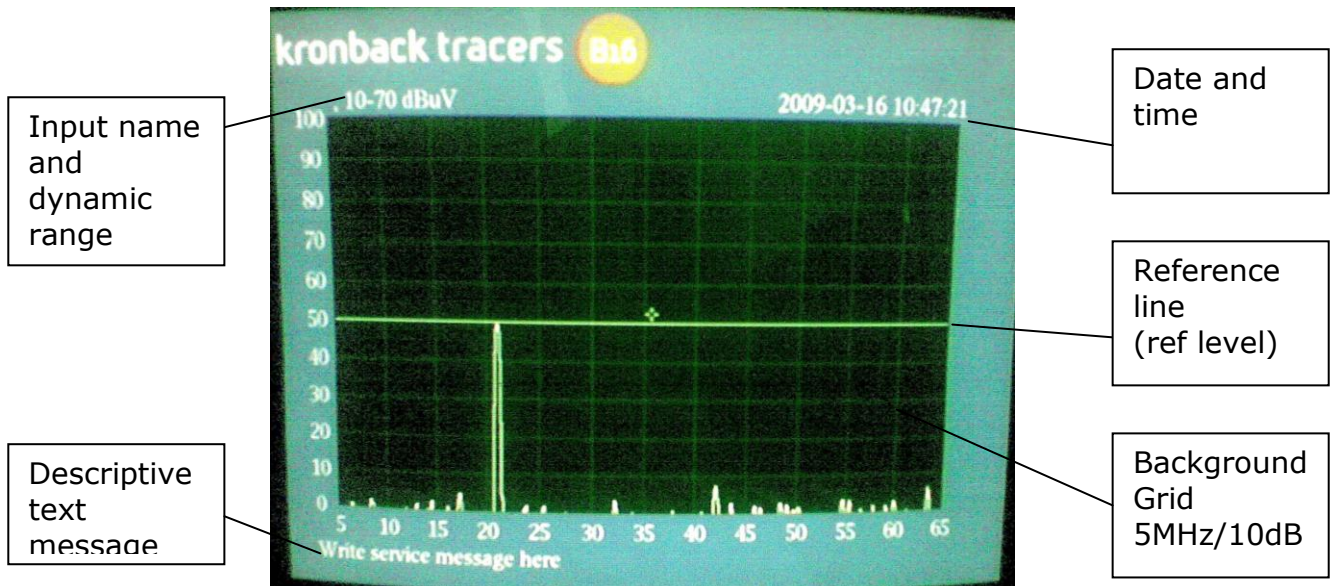


The Video out connector is used controlled from the menu **TV-OUT** in the **B16** user interface.

The output format is CVBS (Composite Video Baseband Signal)
The output standard is PAL. NTSC format is supported, but must be specified on order

During the **B16** boot process the video out presents diagnostics information.
After booting the Video out displays the **TV-OUT** user-interface.

1.6.1. TV-OUT screen



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1.6.2. TV-OUT and RF-SWITCH

The TV out is used together with the **RF-switch**. Please refer to the chapter describing the **RF-switch** for further information.

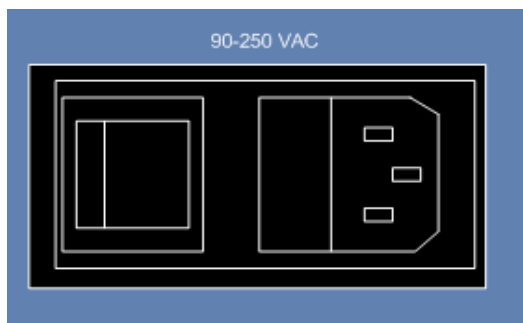
1.6.3. Descriptive text message on TV-OUT

A descriptive message can be displayed on the **TV-OUT** page. This message can be used to inform the Cable TV subscribers why they receive the **B16 TV-OUT** page.

For example *"This channel is used for quality control of the CATV network"*

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1.7. Power Inlet



The **B16** accepts power sources from 90 to 250 VAC, 50 to 60 Hz

Note. The **B16** must always be connected to a power source with ground.

Proper grounding is critical to avoid hazard and to avoid damaging equipment due to voltage differences.

1.7.1. ON/OFF Button

The B16 is turned ON when the left side (marked with '1') is pushed.
The B16 is turned OFF when the right side (marked with '0') is pushed.

1.7.2. Fuse holder

The Fuse holder can only be disassembled when the IEC power connector is not inserted.

Use a flat screwdriver to take out the fuse holder. A spare fuse is available inside the fuse holder.

The B16 uses a 2AT 5x20mm fuse, 250V

1.7.3. Power connector

The IEC connector is type IEC-C14

The power inlet accepts standard IEC type C-13 power connector.

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2. Specifications

2.1. RF specifications

Input 1 – 16

Frequency range 5-65 MHz
Connector: F-type 75 ohm, AC coupled
Return loss: >20dB
Isolation between inputs >60 dB

RF switch

In:

Frequency range: 5-862 MHz
Connector: F-type 75 ohm, AC coupled
Return loss: >20dB@40Mhz, degrading -1.5 dB/octave
Out

Frequency range: 5-862 MHz
Connector: F-type 75 ohm, AC coupled
Return loss: >20dB@40Mhz, degrading -1.5 dB/octave
Disconnected mode:
LED is not lighting
Insertion loss >60 dB
Connected mode:
LED is lighting
Insertion loss < 1 dB

2.2. Video out

Connector: BNC 75 Ohm
CVBS (Composite video baseband signal)
TV standard PAL or NTSC (specify on order)

2.3. Console

Connector:
DB9 male
RS232 standard
Communication parameters:
9600 baud
8 databit
1 stopbit

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No parity
No flow control

2.4. 10/100 BASE-T

10BASE-T: 2-pair UTP/STP
Cat.3, 4, 5 cable EIA/TIA- 568 100-ohm (100m)
100BASE-TX: 2-pair UTP/STP
Cat.5 cable EIA/TIA-568 100-ohm (100m)

Standard Compliance

IEEE 802.3 10Base-T Ethernet
IEEE 802.3u 100Base-Tx Ethernet

Supports:

DHCP
SNMP-trap, for alerts
NTP, Network time protocol
HTTP

2.5. Physical Specifications

Height 88mm (2 units)
Width 482 mm (standard 19" dimensions)
Depth 245mm (9.65")
Weight 6 kg (13.3 lb)

2.6. Electrical

Supply Voltage: 90 – 250VAC. 47-63Hz
Max power consumption: 60 watt
Powersupply connector: IEC
Double pole on/off switch
Fuse: 2A T
Spare Fuse incorporated in IEC socket.

2.7. Environmental

Operating Temperature: 5°C ~ 45°C
Storage Temperature: -20°C ~ 55°C
Operating Humidity: 10% ~ 90%, non-condensing
Fan-less device
No moving mechanical parts inside.

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2.8. System

Accuracy ± 1 dB
 Max Input level 100 dBmV (1 CW)
 CTB > 60 dBC
 CSO > 60 dBC

Data Acquisition

Sampling speed 210MS/s
 Resolution 12 bit
 Effective no. of bit (ENOB) 10,6 bit

FFT (Fast fourier transform)

Filter type: FLAT TOP
 Filter bw: 300kHz

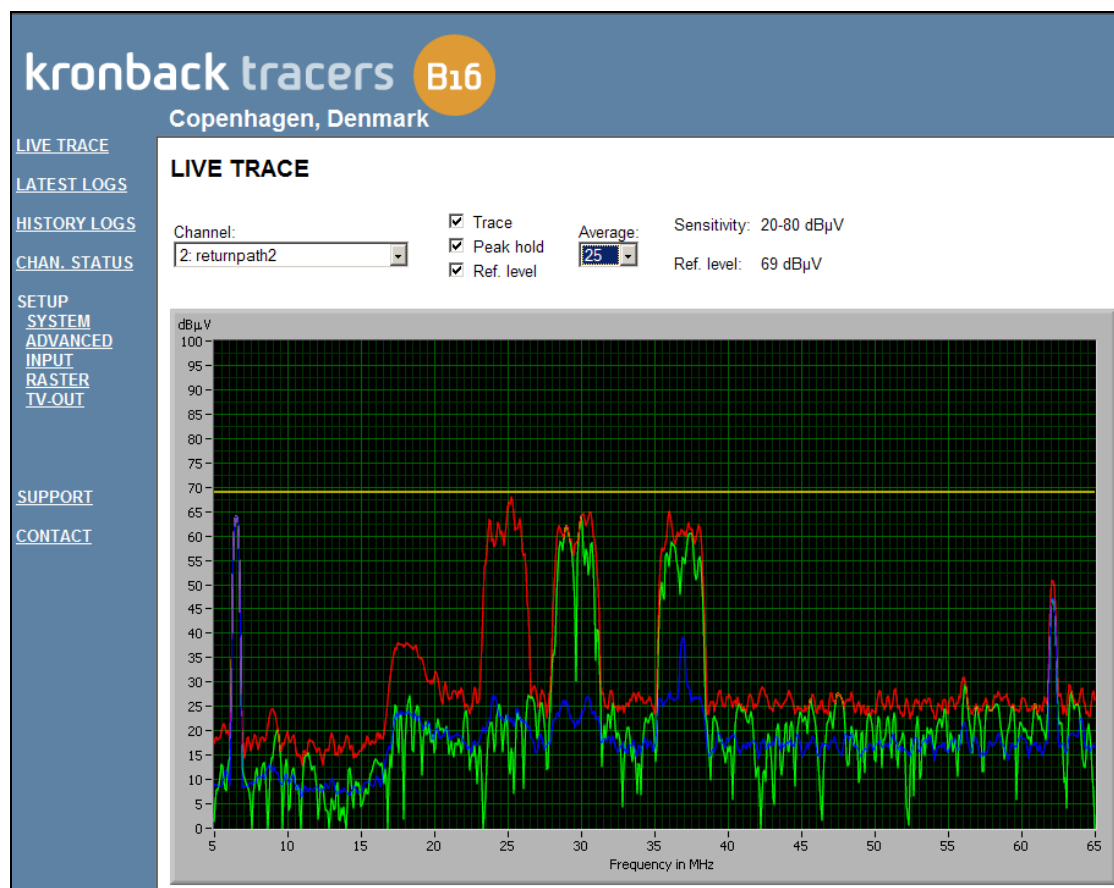
2.9. Internal attenuation

Att.	Max input level	Sensitivity	Dynamic range
0 dB	70 dBmV	10 dBmV	60 dB
10 dB	80 dBmV	20 dBmV	60 dB
20 dB	90 dBmV	30 dBmV	60 dB
30 dB	100 dBmV	40 dBmV	60 dB

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3. User interface

3.1. LIVE TRACE



3.1.1. Channel

The channel selection field selects which input that is presented in the **LIVE TRACE** window. Multiple users can monitor any input simultaneously.

3.1.2. Trace

Selecting this field enables the green trace (**LIVE TRACE**) in the trace window. The trace is updated approximately 2 times per second.

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3.1.3. Peak hold

Selecting this field enables the red trace (peak hold) in the trace window.

3.1.4. Ref level

Selecting this field enables the yellow line in the trace window. The reference level is configured individually for each channel in the **SETUP→INPUT** menu. The reference value should be set to the cable modems peak level and is used as reference for all carrier/noise (C/N) calculations within the B16.

3.1.5. Average

Selecting this field to anything else than OFF, will enable a blue average trace. The average line is based on a number of consecutive green traces. The maximum number of green traces averaged is 25.

3.1.6. Sensitivity

The B16 has 4 attenuation ranges that can be assigned to each input channel.

Attenuation	B16 noisefloor is below	Max signal level(1CW)
0 dB	10 dBuV	70dBuV
10 dB	20 dBuV	80dBuV
20 dB	30 dBuV	90dBuV
30 dB	40 dBuV	100dBuV

An Overload text is displayed in the **LIVE TRACE** window 1-2 dB before overload state is reached.

All settings in the **LIVE TRACE** window are active only in the local browser and will not affect other users that are concurrently using the B16.

Note however that the **LIVE TRACE** window starts up in the same mode as it was left by the latest user of the B16. So if USER A was monitoring channel 14 with peak hold on and average set to 5 then this is the start-up page of USER B if he later accesses the **LIVE TRACE** window.

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3.1.7. Trace window

The graph has fixed Y Axis of 0 dBuV to 100 dBuV.
The X axis is fixed at 5MHz to 65MHz.

3.1.8. SVG technology

B16 uses the SVG technology to to enable live traces to be displayed in browsers like Internet Explorer. SVG is an abbreviation for Scalable Vector Graphics, and is a standard that is approved by the W3C standardisation group. However not all browsers complies to this standard. Plug-ins for most browsers can however be downloaded from www.adobe.com/SVG.

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3.2. LATEST LOG

The screenshot shows a web browser window titled 'Kronback Tracers - Microsoft Internet Explorer'. The address bar shows 'http://80.167.102.37/'. The page header includes the logo 'kronback tracers B16' and the location 'Copenhagen, Denmark'. A left-hand navigation menu contains links for LIVE TRACE, LATEST LOGS, HISTORY LOGS, CHAN. STATUS, SETUP, SYSTEM, ADVANCED, INPUT, RASTER, and TV-OUT. The main content area displays the title 'LATEST LOGS, 2009-02-09 20:10:06' and a table with the following data:

Input	Timestamp	Description
1	2009-02-09 19:43:57	returnpath1
2	2009-02-09 19:44:03	returnpath2
3	2009-02-09 19:44:06	returnpath3
4	2009-02-09 19:44:09	returnpath4
5	2009-02-09 19:44:10	reference signal 71.1dBuV

The **LATEST LOG** page displays the channels that are currently being logged. The channel number and names are presented. The timestamp shows the time of the latest logged file.

3.2.1. Open the LATEST LOG graph

Click on the timestamp to open the **LATEST LOG** graph.

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3.2.2. LATEST LOG graph

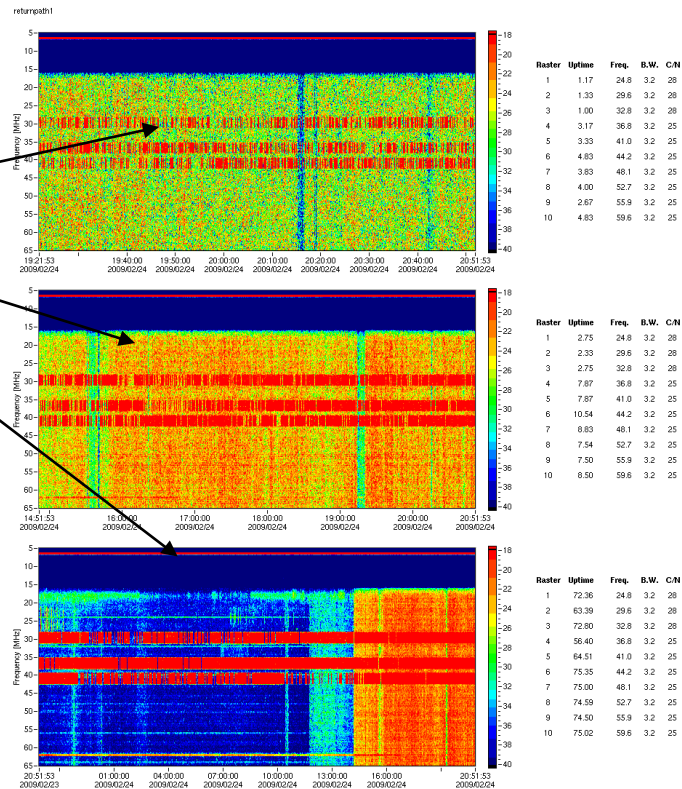
This graph is divided in 3 subgraphs. The top graph (1,5hours) is consolidated into the middle graph (6 hours) which is again consolidated in the button graph (24hours).

The 1,5 hours graph is based on 600 samples. Each dot on the x axis represents a sample. Since B16 stores a sample each 9th second the width is

$$600 \text{ samples} \times 9 \text{ sec/sample} = 5400 \text{ sec} = 90 \text{ min} = 1,5\text{h}$$

Note that the **LATEST LOG** graph is updated each 1,5 hours. The most right timestamp under each graph displays the time when the graph was last updated.

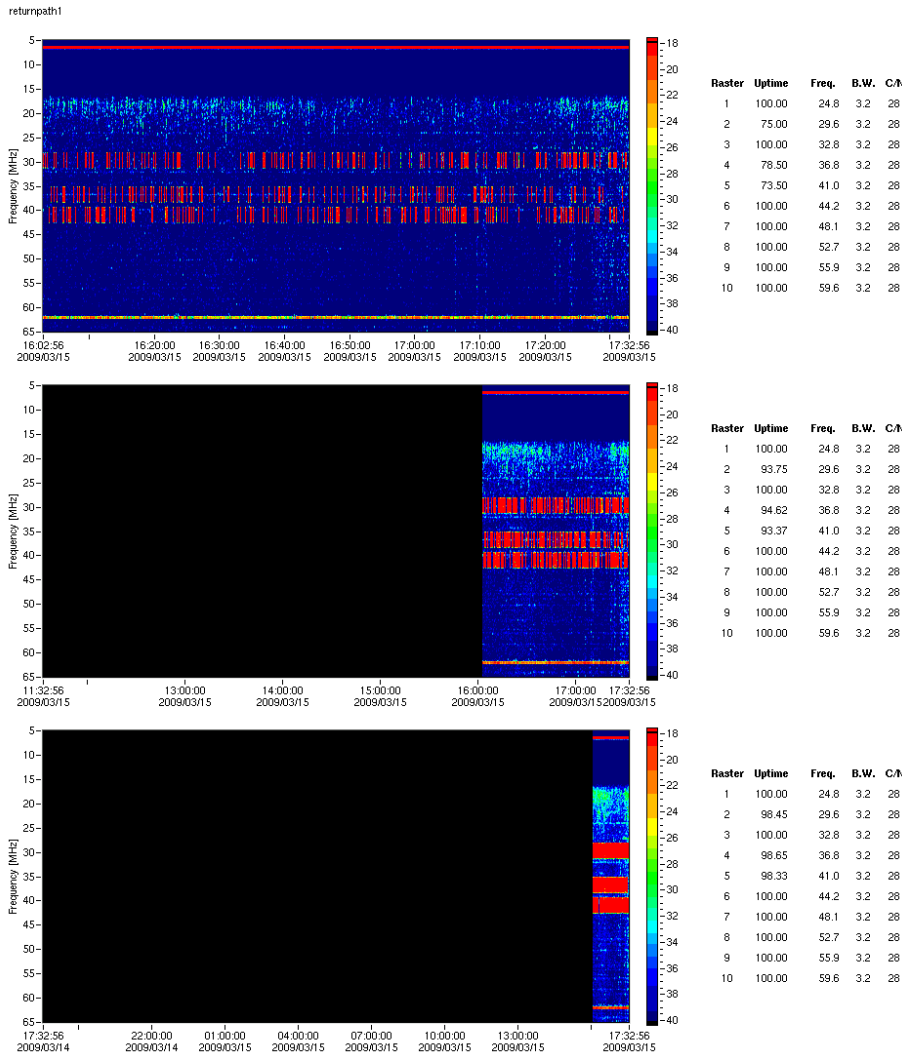
Graph	Time
Top	1,5 hour
Middle	6 hours
Bottom	24 hours



3.2.3. Consolidation

Consolidating is done by merging a slice with a width of 6 dots into a slice of 1 dot.

The consolidation is performed by following a “worst case” approach, so that the most red of the 6 values is chosen in a “highest takes precedence” principal. As a consequence the 24 hours graph will look worse (more red) than the 6 hours graph and the 6 hours graph will look worse (more red) than the 1,5 hours graph. Each 24 hours the bottom graph (24 hours graph) is saved in the history storage. This storage is accessible in the main menu of **B16** under **HISTORY LOGS**



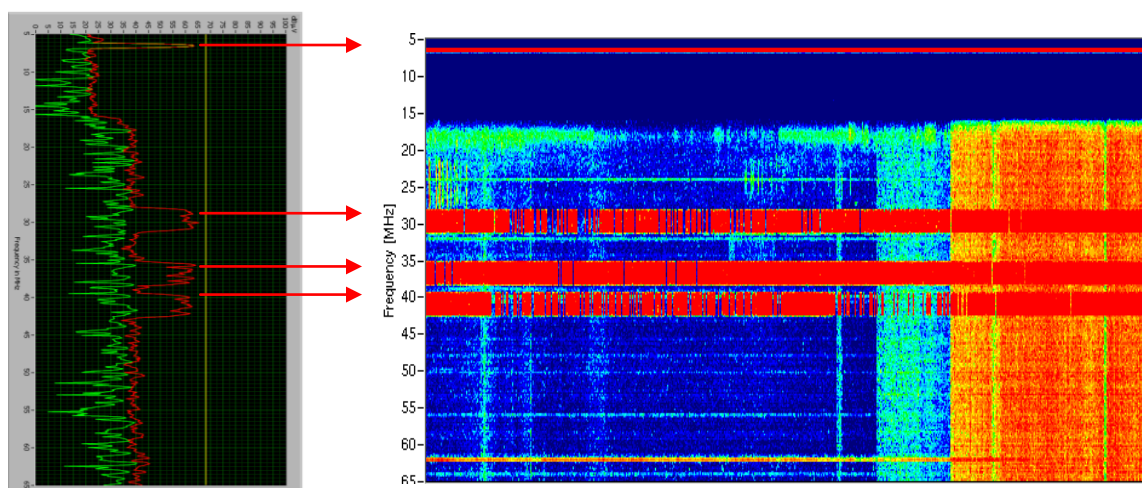
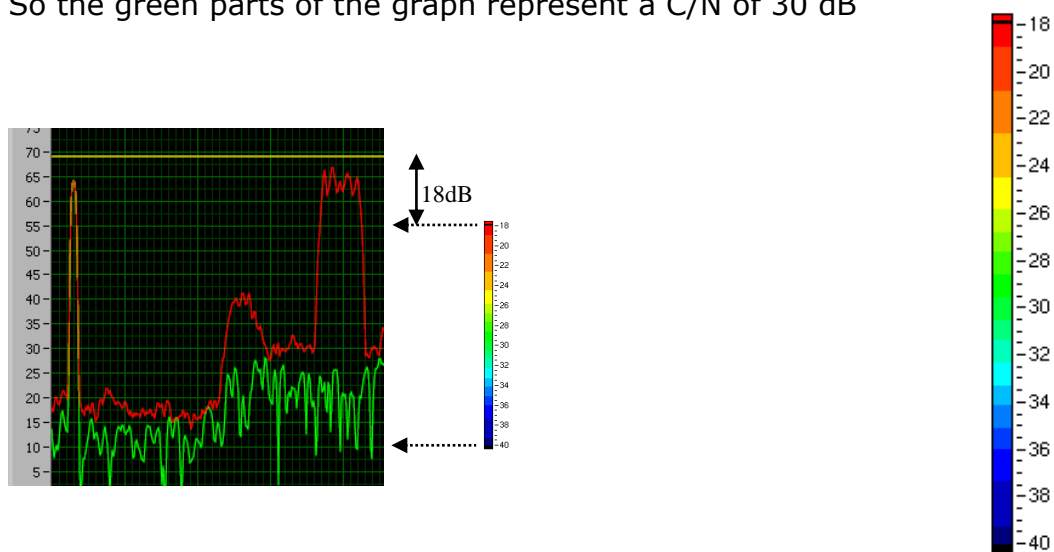
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3.2.4. Color Coding

The log graphs are color-coded. The color represents the difference between the yellow line and the actual trace.

Differences less than 18 dB are pure red and differences over 40 dB are pure blue.

Example: Green color in the **LATEST LOG** graph represents a difference between the yellow line and the signal off approximately 30 dB. So the green parts of the graph represent a C/N of 30 dB



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3.2.5. Uptime calculation table

Next to each **LATEST LOG** graph is a table that presents the uptime. The table covers the same time period as the graph.

Raster	Uptime	Freq.	B.W.	C/N
1	72.36	24.8	3.2	28
2	63.39	29.6	3.2	28
3	72.80	32.8	3.2	28
4	56.40	36.8	3.2	25
5	64.51	41.0	3.2	25
6	75.35	44.2	3.2	25
7	75.00	48.1	3.2	25
8	74.59	52.7	3.2	25
9	74.50	55.9	3.2	25
10	75.02	59.6	3.2	25

The resulting "uptime" is calculated by looking into each raster and checking how many of the measurements that was not exceeding the C/N threshold.

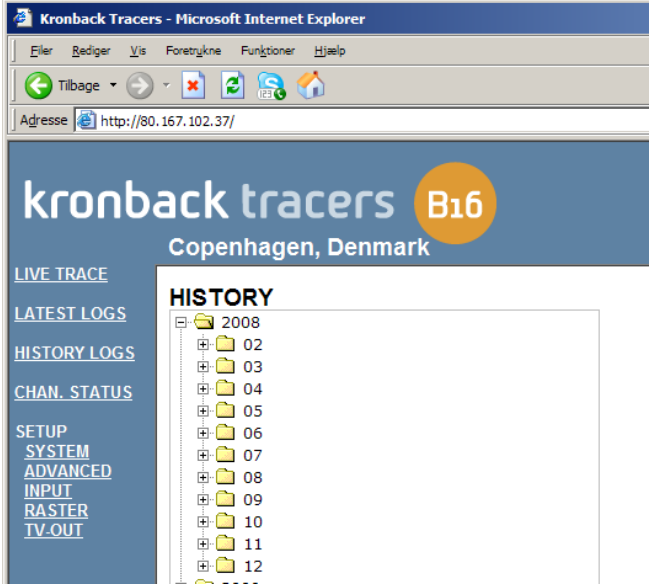
Since the uptime is presented in percent, 100% means that the C/N threshold was never exceeded. Each time the threshold is exceeded the uptime is decreased.

The calculation of uptime however is not - like the graphs - consolidated, so the 1,5 hours uptime values are based on 600 samples, the 6 hours are based on 2400 samples and the 24 hours on 9600 samples.

The columns Raster, Freq. B.W and C/N are configured in the menu **SETUP→RASTER**

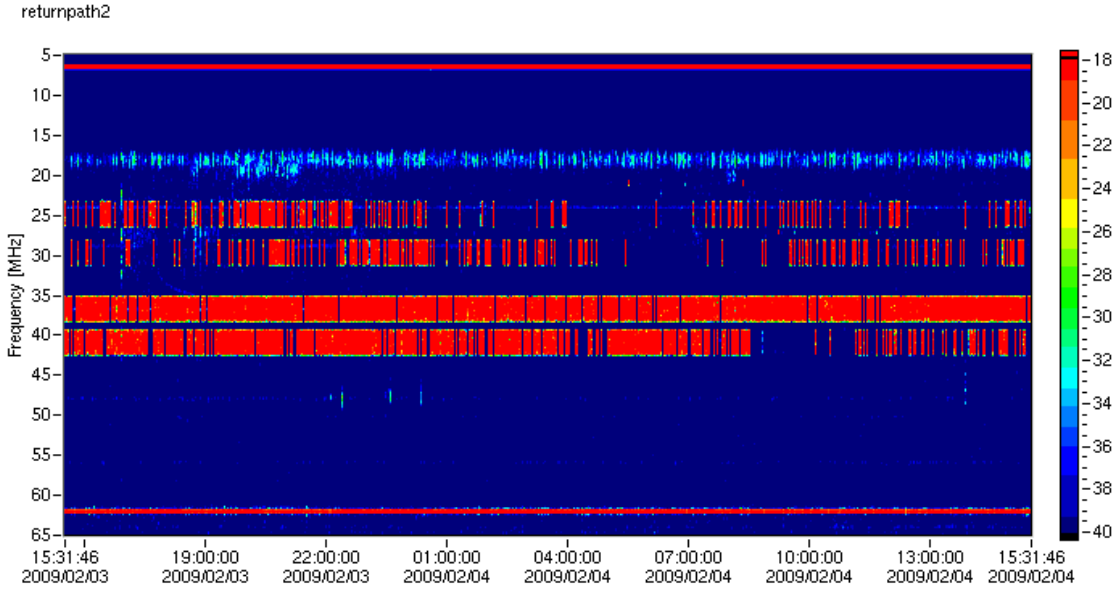
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3.3. HISTORY LOG



3.3.1. 24 hours storage

History graphs are stored each 24 hours.



3.3.2. Color coding

The history graph uses same color coding as the **LATEST LOG** graph

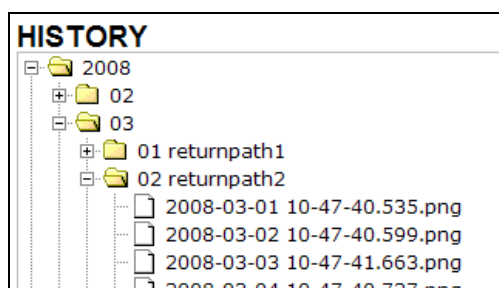
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3.3.3. Log storage

The history data are stored in a non-volatile memory of the B16. History graphs are accessed by entering the tree structure in the **HISTORY LOG** menu. This structure is organized in

year, month, channel and day



3.3.4. Log capacity

The internal storage capacity of B16 is 1 GByte. The B16 firmware occupies 250 Mbyte, 100 Mbyte are reserved for latest log storage, leaving 650 MByte for the history log. When this storage is filled the B16 will throw away the oldest data.

3.3.5. Auto archive

Data can however be sent as an email attachment before it is thrown away. This is done by selecting the "Auto-archive" choice in the menu **SETUP→SYSTEM**

BASIC SYSTEM SETUP

Site name

E-mail Enable: Alarms Overload Auto-archive

E-mail to

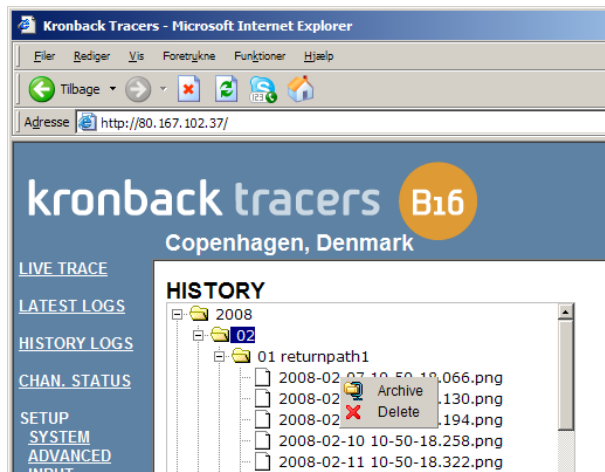
E-mail cc

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3.3.6. Manual log maintenance

It is possible to delete or archive history data manually by pointing the cursor to the text of the item that should be archived or deleted and right-clicking the mouse button.



Note that the cursor must be over the text, not the folder.

3.3.7. Manual log archiving

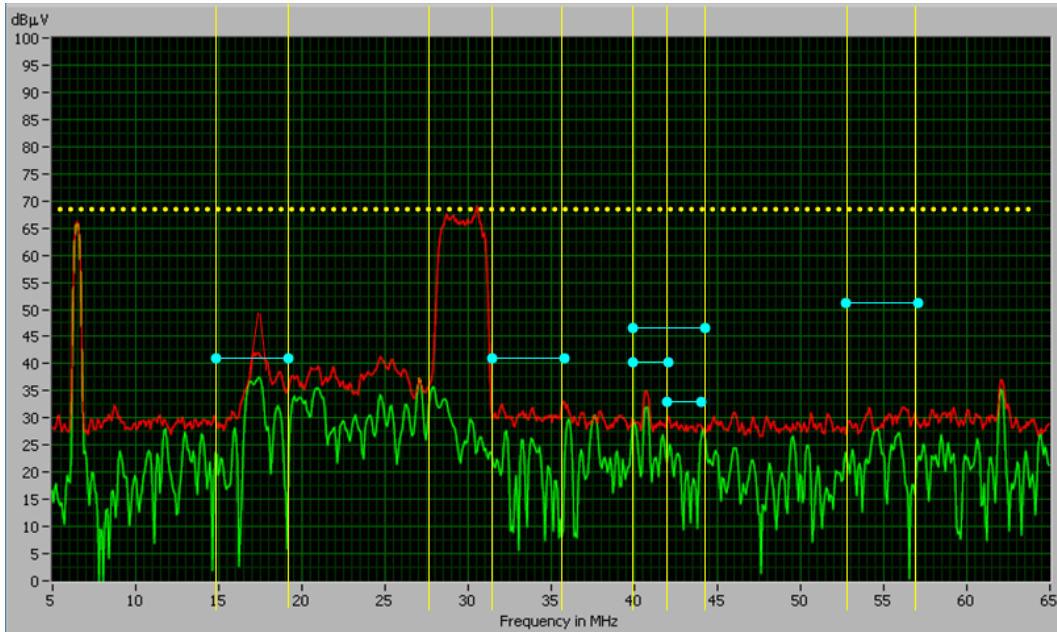
The archive choice saves the files from the selected folder to a .zip archive. Note that a maximum of 500 history files can be saved each time. The log files are not deleted from the B16 using the Archive function.

3.3.8. Manual log deletion

The delete choice erases the files in the selected folder. This function is however protected by the general B16 password.

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3.4. Raster and channel status



The menu **SETUP→RASTER** and the menu **CHANNEL STATUS** are closely connected. This is the reason for describing both menus in the same chapter of this manual.

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RASTER SETUP

Nr.	Freq. [MHz]	B.W.	Uptime calc. C/N	Instant alarm C/N	Repeated alarms C/N	Carrier Detection C/N
1	24.8	3.2	28	18	25	20
2	29.6	3.2	28	18	25	20
3	32.8	3.2	28	18	25	20
4	36.8	3.2	28	18	25	20
5	41.0	3.2	28	18	25	20
6	44.2	3.2	28	18	25	20
7	48.1	3.2	28	18	25	20
8	52.7	3.2	28	18	25	20
9	55.9	3.2	28	18	25	20
10	59.6	3.2	28	18	25	20
Period					15 min	1 min
Required uptime					99	%

Save Raster Setup

3.4.1. Raster parameters

The spectrum in B16 can be divided into ten rasters. The rasters are defined as a centre frequency and a bandwidth. The centre frequency can be selected with 1 decimal, and the bandwidth can be selected in steps of 400kHz, 800kHz, 1,6MHz, 3,2 MHz and 6,4 MHz.

The rasters are used for calculation of the uptime, ingress alarms and carrier detection alarms.

3.4.2. Reference line

The C/N values that can be entered in the raster columns are all referenced to the yellow line (reference level). The value of the reference line is entered in the **SETUP→INPUT** menu and should be set to the cable modems peak level.

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3.4.3. Uptime

Uptime
calc.
C/N

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

28 ▾

The uptime calculation C/N values are used to update the uptime tables in the **LATEST LOG** and the **HISTORY LOG** graphs.

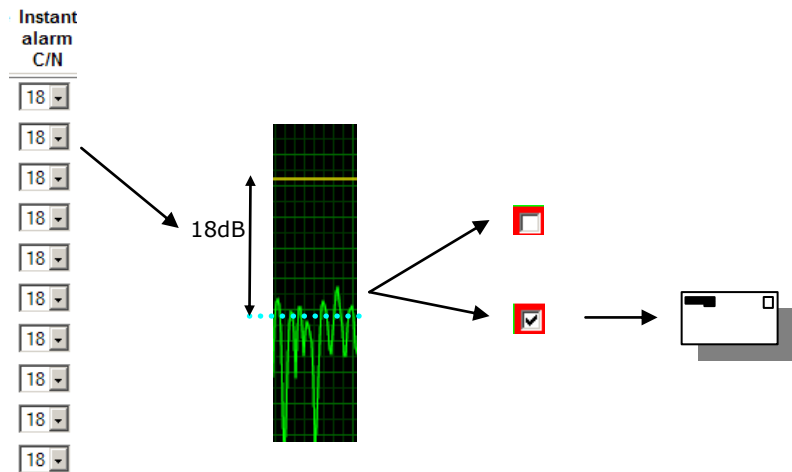
Each time a C/N threshold is exceeded, the uptime is decreased, starting from 100 % going down to 0%

The uptime table is representing the same time period as the associated color graph.

Raster	Uptime	Freq.	B.W.	C/N
1	99.93	24.8	3.2	28
2	81.01	29.6	3.2	28
3	99.99	32.8	3.2	28
4	85.91	36.8	3.2	25
5	80.36	41.0	3.2	25
6	99.99	44.2	3.2	25
7	100.00	48.1	3.2	25
8	99.99	52.7	3.2	25
9	99.99	55.9	3.2	25
10	99.99	59.6	3.2	25

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3.4.4. Instant alarm



The **Instant alarm** function is used to create immediate ingress alarms

On alarm the squares in the **CHANNEL STATUS** page turns red.

If these squares are checked an alarm notification per square will be sent. The notification can be an E-mail or a SNMP trap

One notification is sent on each alarm event. This could cause many emails being sent from the B16 in short time. To avoid this use instead the **repeated alarm** function.

E-mails are only sent when **instant alarm** turns on, not when the alarm state clears.

The advantage of **instant alarm** is that it is possible to be alerted immediately if the ingress noise level reaches a level that causes severe problems for the cable modem operation. To avoid **instant alarm** from spamming mailboxes, the threshold (C/N) should however be set to a relative low value (close to the yellow reference line).

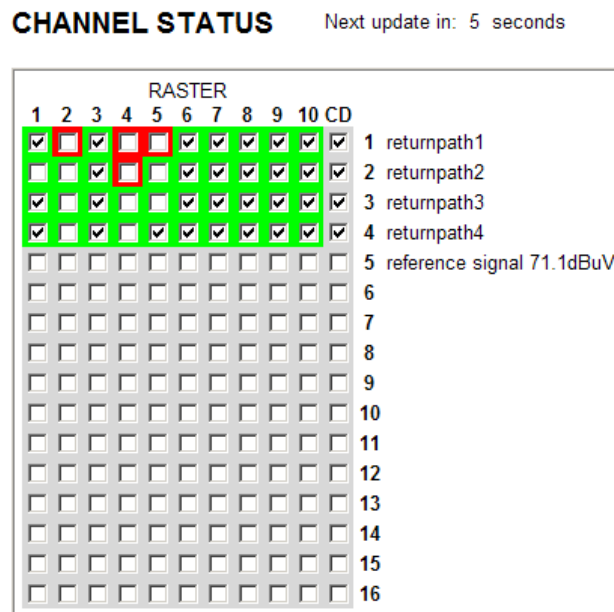
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3.4.5. Instant alarm as activity monitor

Instant alarm can also be used to ensure that cable modem traffic is active. The red squares in the **channel status** view shows the modem activity.

This will provide users with a modem activity monitor on each carrier frequency defined in the raster setup.



This screenshot shows modem activity on returnpath1 and returnpath2

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3.4.6. Repeated alarm

Repeated alarms C/N

25
25
25
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25
25

The **repeated alarms** function is used to report alarms over a time period. After this period one notification will be sent.

The purpose of **repeated alarms** is to avoid that the email receivers are being spammed with alarms.

Period

Required uptime %

The time period can be set from 5 minutes to 24 hours. After this period each channel and raster is being evaluated. Only channels and rasters that do not meet the required uptime will be reported in the notification.

Note only rasters that are checked in the **channel status** page will be reported in the **repeated alarms** notification.

3.4.7. Repeated alarm example:

The period is set to 15 minutes. Within this period each raster is scanned each 9 second, or 100 times. 2 of the measurements did exceed the **repeated alarm** threshold, giving 98% of good measurements. The required uptime is however 99%, so this raster will be reported in the **repeated alarms** notification.

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3.4.8. Carrier detection (CD)

Carrier Detection C/N

20

20

20

20

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20

The **carrier detection** function is used to report inactivity (or silence) over a time period.

After this period a notification will be sent if no activity is present.

The time period can be set from 1 minute to 24 hours

To activate **carrier detection** the CD field in the **channel status** page must be checked.

1	2	3	4	5	6	7	8	9	10	CD	1 returnpath1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The **carrier detection** function will only look for activity in rasters that are unchecked.

The **carrier detection** function only requires that just one of the unchecked rasters in a channel shows activity to accept that activity is present on that channel.

Note that the C/N values can be set to monitor the ingress noise. The C/N value would typically be around 45 dB. A sudden lack of ingress noise is a good indicator that the optical fiber connection could be down.

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3.4.9. Instant alarm Checklist

Check:

- mail client settings in **SETUP→ADVANCED→MAIL**
- the mail addresses entered in **SETUP→SYSTEM**
- the SNMP destination and community string in **SETUP→SYSTEM**
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for E-mail alarms
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for SNMP Traps
- that rasters are checked in the **CHANNEL STATUS** page
- that the rasters that should send alarm are red.
- **increase instant alarm** C/N thresholds in **SETUP→RASTER** to force alarm

3.4.10. Repeated alarm checklist

Check:

- mail client settings in **SETUP→ADVANCED→MAIL**
- the mail addresses entered in **SETUP→SYSTEM**
- the SNMP destination and community string in **SETUP→SYSTEM**
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for E-mail alarms
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for SNMP Traps
- that rasters are checked in the **CHANNEL STATUS** page
- **increase repeated alarm** C/N thresholds in **SETUP→RASTER** to force alarm

3.4.11. Carrier detection checklist

Check:

- mail client settings in **SETUP→ADVANCED→MAIL**
- the mail addresses entered in **SETUP→SYSTEM**
- the SNMP destination and community string in **SETUP→SYSTEM**
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for E-mail alarms
- that the Alarms checkmark is checked in **SETUP→SYSTEM** for SNMP Traps
- that rasters are **unchecked** in the **CHANNEL STATUS** page
- that the CD checkmark is checked for the channel that should send alarm
- **decrease Carrier detection** C/N thresholds in **SETUP→RASTER** to force alarm

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3.5. System

3.5.1. Site name

The Site name field is used to enter a descriptive name for the **B16**. The name is presented in the header of the **B16** web page for identification of the system.

3.5.2. Email Enable


This section is used to select which type of emails that should be sent.

3.5.2.1. Alarms

If checked the B16 will send all type of alarms: **Instant alarm**, **Repeated alarms** and **Carrier Detection alarm**.

If unchecked no alarm E-mails will be sent.

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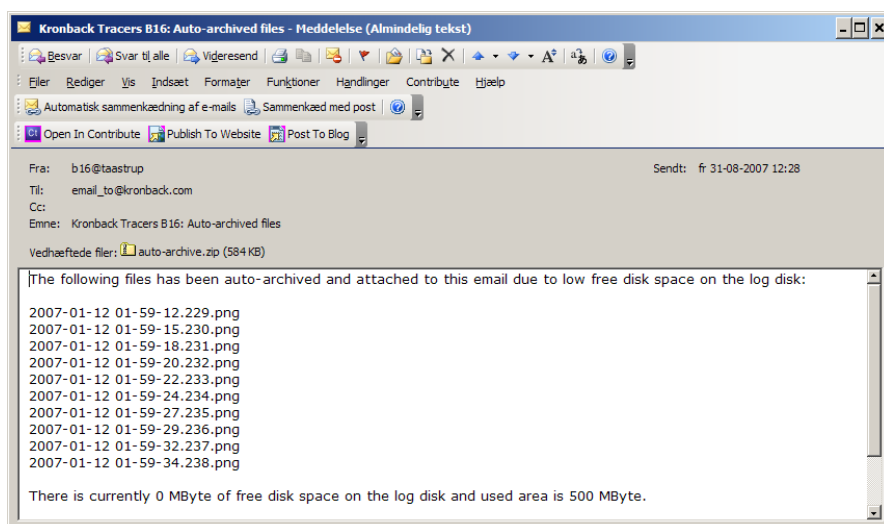
3.5.2.2. Overload

This field will activate alarms in case that the signal level of a B16 input is exceeding the allowed input range, causing the internal A/D converter to be overloaded. The input range can be set in the menu **SETUP→INPUT**.

Note: Since the A/D converter of the B16 has behaviour identical to optical laser equipment this alarm also indicates risk of laser clipping.

3.5.2.3. Auto-Archive

The B16 can send the **HISTORY LOG** files prior to deletion. The log files are attached to an E-mail:



3.5.3. E-mail to

Enter the email address of the receiver.
Multiple receivers can be entered separated with semicolon (;)

3.5.4. E-mail cc

Enter the email address of the receiver that should be on cc (carbon copy) when emails are sent.
Multiple receivers can be entered separated with semicolon (;)

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3.5.5. SNMP Enable

Has the same functionality as the E-mail enable field, and is used to activate or deactivate transmission of SNMP traps.

3.5.6. SNMP Community.

Enter the SNMP community string in this field. Typically entered as "private" or "public"

3.5.7. SNMP Destination.

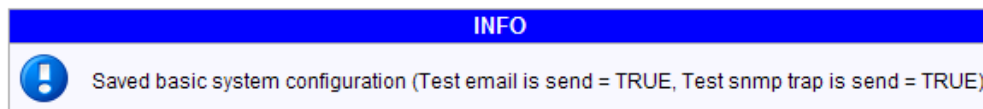
Enter the destination IP address of the receiving management system. Both IP addresses (e.g 10.10.10.55) or DNS addresses (e.g snmpc.kronback.com) can be used. Only one destination address is allowed in the SNMP Destination field.

3.5.8. Save basic system setup button.

This button saves the setting entered in the **SYSTEM** page and activates a test E-mail and SNMP trap transmission.

If the E-mail Enable Alarm field is checked a test email will be sent to the recipients entered in the E-mail to and E-mail cc fields.

If the SNMP Enable field Alarm field is checked a test SNMP trap will be sent to the address entered in the SNMP Destination field.



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3.6. Setup Advanced



3.6.1. Username and password

This **SETUP→ADVANCED** menu is password protected.

Factory username is **admin**

Factory password is **1234**

The password can be changed in the **SETUP→ADVANCED→SECURITY** menu or via the serial console of the B16.

3.6.2. Switch

Setting up the topology when multiple S16 switches are installed.

3.6.3. Network

IP parameters of the B16

3.6.4. Date & Time

The B16 time and date settings and NTP client parameters

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3.6.5. Mail

Configuration of the B16 mail client.

3.6.6. Security

Username, password and license code maintenance

3.6.7. Get Settings

Backup of B16 user configuration

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3.7. Switch setup

The **SETUP→ADVANCED→SWITCH** menu is used to define the topology when multiple external switches are connected to **B16** for input expansion.

3.7.1. Switch topology

Up to 16 external switches can be entered, providing a 256 input **B16** system. If no external switches are used, the setting **B16** only (16 inputs) should be entered - even if the **B16** is configured with a input limited license code.

The number of inputs that is set via the switch configuration menu is globally changing all pages and menus in the **B16** related to inputs.

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3.7.2. Input steps

Each additional input switch provides 16 inputs, but occupies 1 input for the cascade connection to **B16**, so the input increments are in steps of 15.

Number of switches	Number of inputs
B16 only	16
1	31
2	46
3	61
4	76
5	91
6	106
7	121
8	136
9	151
10	166
11	181
12	196
13	211
14	226
15	241
16	256

3.7.3. Switch interface

Switch compatibility parameter. It must be 16 consecutive 1's when using **kronback tracers S16** as external switches and 16 consecutive 0's when the using the discontinued **kronback tracers B+** switch.

Switch type	Switch interface field
Kronback tracers B+	0000000000000000
Kronback tracers S16	1111111111111111

External switches must be connected to the **B16** from input 16 and down. The inputs of the **B16** that are not used for the cascading are always the last inputs of the system.

Please see the "Topology example 61 inputs" chapter.

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3.7.4. IP address

IP address of the connected switches. These must be formatted as IP-addresses (e.g. 192.168.100.81) DNS names are not allowed.

3.7.5. Port

The port number used for the IP socket connection to the external switches. It is factory preset to 1000 in the S16 switches, but can be changed from the console interface of the S16.

3.7.6. Timeout

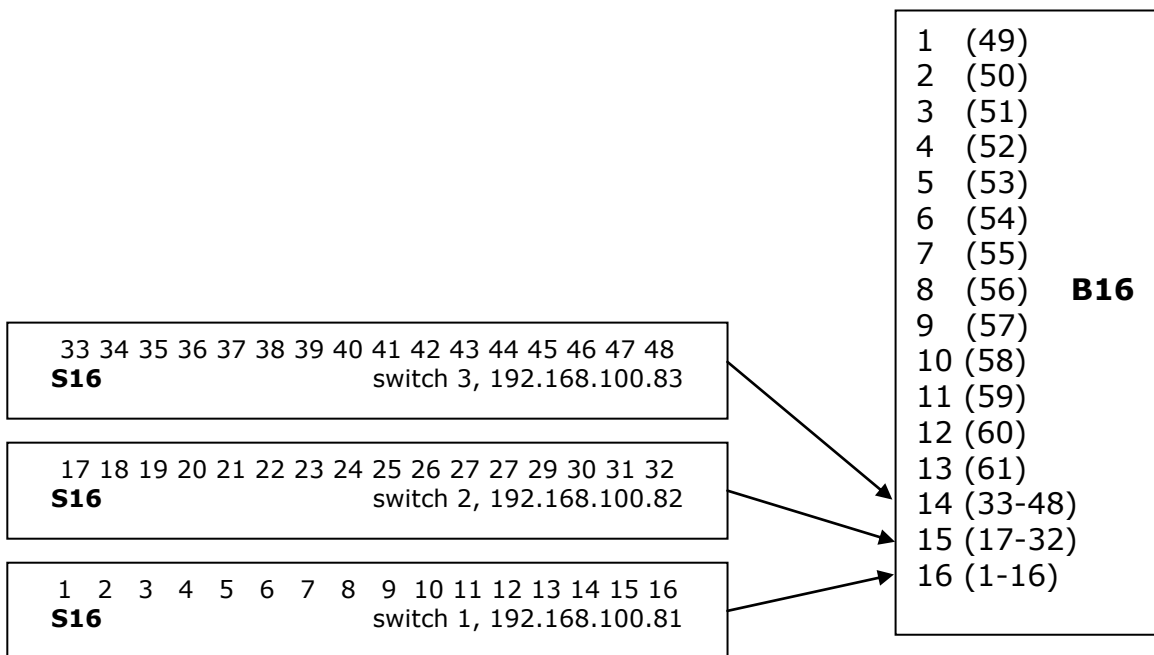
The timeout parameter decides how long time [ms] the B16 switch routine will try to re-connect to the S16 in case of missing network connectivity. For most networks 60 ms are recommended.

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3.7.7. Topology example 61 inputs

A 61 input system is built of 1 **B16** and 3 **S16**.

- The **S16** connected to **B16** input 16. (input 1 to 16 in the **B16** user interface)
- The **S16** connected to **B16** input 15. (input 17 to 32 in the **B16** user interface)
- The **S16** connected to **B16** input 14. (input 33 to 48 in the **B16** user interface)
- This leaves input 1 to 13 of the **B16** free (input 49 to 61 in the **B16** user interface)



3.7.8. Insertion loss compensation

An internal routine in the **B16** ensures that the measurements on the cascaded input 1 to 48 are compensated for the extra insertion loss caused by the **S16**.

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3.7.9. State check

The state of each **S16** and **B16** setting can be verified by viewing the LED´s over each f-connector.

To verify correct configuration, simply run through all inputs from the livetrace menu. Check that the correct LED´s on the **B16** and **S16** fronts are lighting.

For further assurance, a signal generator could be connected to each input for verification of correct signal paths and levels.

3.7.10. LED´s on unused inputs

Note that the **B16** does not switch the LED´s on inactive **S16** switches off. The reason for this is to avoid unnecessary IP traffic on switch-off commands and to ensure optimal switching speed. However the combination of the **B16** LED and the LED of the associated switch will still be correct.

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3.8. Network Setup

3.8.1. Factory network settings

The B16 is shipped with following factory settings

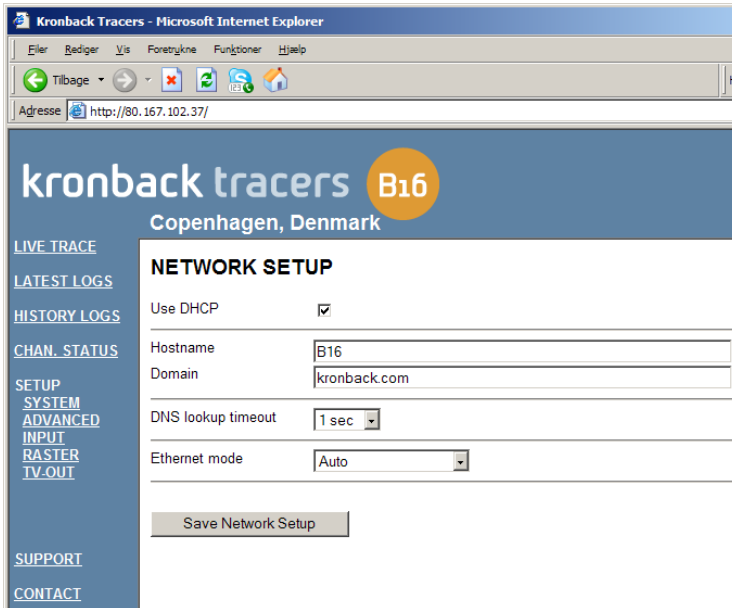
setting	Value
IP Address	192.168.205.10
Subnet Mask	255.255.255.0
Gateway	192.168.205.1
DNS	Not configured
DNS lookup timeout	1 sec
Ethernet mode	Auto

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3.8.2. Dynamic IP address, DHCP

The network menu layout is dependant on the first choice, DHCP.

If DHCP is selected the fields Hostname and Domain is configurable. This will enable users to assign the **B16** to a domain controller with a hostname.



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3.8.3. Fixed IP address, non DHCP

If DHCP is not selected, the basic network parameters the fields are manually configurable:

- IP address
- Subnet Mask
- Gateway
- DNS primary
- DNS secondary

kronback tracers B16
Copenhagen, Denmark

NETWORK SETUP

Use DHCP

IP address: 192.168.1.21
Subnet mask: 255.255.255.0
Default gateway: 192.168.1.1

Primary DNS server: 193.162.153.164
Secondary DNS server: 194.239.134.83
DNS lookup timeout: 1 sec

Ethernet mode: Auto

Save Network Setup

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3.8.4. DNS server optional

The **B16** does not require DNS servers. However if DNS servers are not entered, the information in the SNMP, Email and NTP configuration pages must be formatted as IP addresses (e.g. 192.168.205.10) and not domain names.

3.8.5. DNS lookup timeout

The setting DNS lookup timeout can be set from 1 second to 10 seconds. This setting ensures that the **B16** will not continue to look for a DNS server for more than the selected time, if the DNS servers for some reason are not available. Recommended setting is 1 sec.

3.8.6. Link speed setting

Ethernet mode is used to configure the physical parameters of the Ethernet connector on the B16 front panel.

The possible settings are :

Value
Auto (auto negotiation)
10 Mbit Half Duplex
10 Mbit Full Duplex
100 Mbit Half Duplex
100 Mbit Full Duplex

All settings on the Network page will take effect after a reboot of the **B16**. The "Save network setup" saves the settings and reboots the **B16**.

3.8.7. Rebooting B16

The "Save network setup" can also be used to reboot of the **B16** if this is required.

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3.8.8. Network configuration from console

The Network parameters of the B16 can be configured in 2 ways.

using the network submenu (**SETUP→ADVANCED→NETWORK**)

or

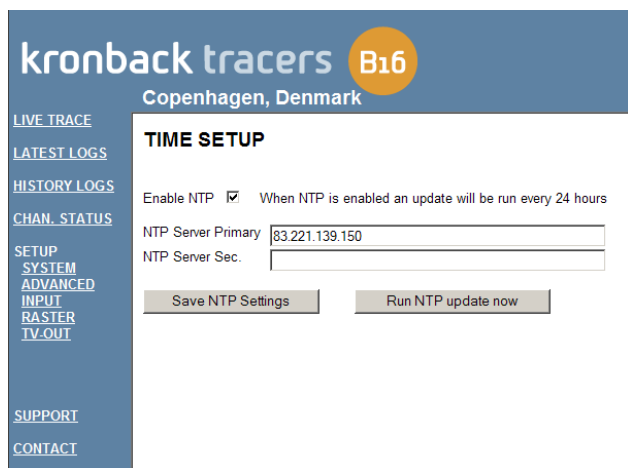
Using a console cable connected to the console connector of the **B16**

See the chapter **Console interface** for more information on setting network parameters from the console.

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3.9. Time setup



The time setup menus is used to configure the time and date settings in the **B16**

3.9.1. NTP

If the Enable NTP checkbox is selected, the **B16** will obtain time and date information from the NTP servers that are entered in the NTP Server Primary or NTP Server Secondary fields.

The NTP servers can be entered as IP addresses or domain names.

The **B16** will connect to the servers each 24 hours, starting after the "Save NTP Settings" is pressed. Pressing this button also updates as well the BIOS date and time of the **B16** to ensure that time and date is kept after power down of the **B16**.

The time can at anytime be updated using the "Run NTP update now" button.

3.9.2. Daylight saving time

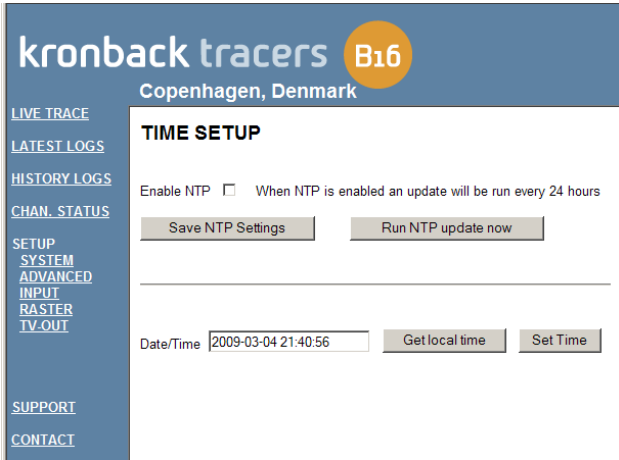
Daylight saving time is automatically handled by the B16

3.9.3. Timezones

The B16 is factory configured to the timezone CET (Central European time). To change this setting, please contact kronback tracers support.

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3.9.4. Manual time setting

If the Enable NTP checkbox is not selected, date and time can be entered manually following the format

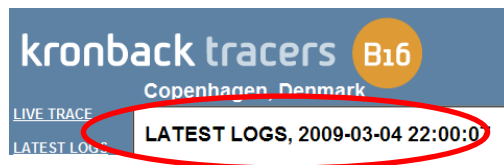
yyyy-mm-dd hh:mm:ss

Pressing the "Save NTP Settings" button when the Enable NTP is deselected will make the manual time mode default. Otherwise the Time and date page defaults to NTP mode next time the page is entered.

The "Get local time" button can be used to obtain the date and time information from the PC from the local PC. Pressing "Set time" will transfer the time and date to the **B16**.

3.9.5. Verifying the date and time settings

The actual date and time of the **B16** can always be verified from the **LATEST LOG** menu.



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3.10. E-Mail setup

3.10.1. Mail Setup

The advanced mail settings of **B16** are configured from the **SETUP→ADVANCED→MAIL** menu.

3.10.2. Mail server address

Enter IP address or DNS name of the SMTP server that should receive the mail messages from **B16**

3.10.3. Mail server address

As default the standard SMTP server port (25) is entered. Other port numbers can be entered if required.

3.10.4. Mail are sent from

The name in this field is presented as the From field in emails sent from **B16**.

3.10.5. Admin mail account

All emails sent from the **B16** will be sent to this admin mail account. This field can be used for diagnostics and fault finding, but is not intended for normal B16 operation. Multiple email addresses can be entered separated by semi-colon (;)

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3.10.6. Save mail setup

The save mail setup button saves the settings in the Mail setup page.

3.10.7. Test mail

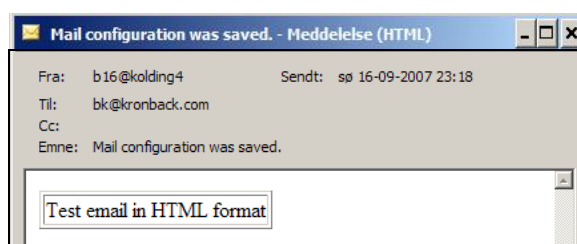
If changes has been made all mail-receivers will be notified.

Receivers are:

- the Admin mail account
- the SETUP→SYSTEM menu Mail To
- the SETUP→SYSTEM menu Mail CC

The test mail contains the subject line *Mail configuration was saved.*

This mail is formatted as HTML.



3.10.8. E-mail buffer

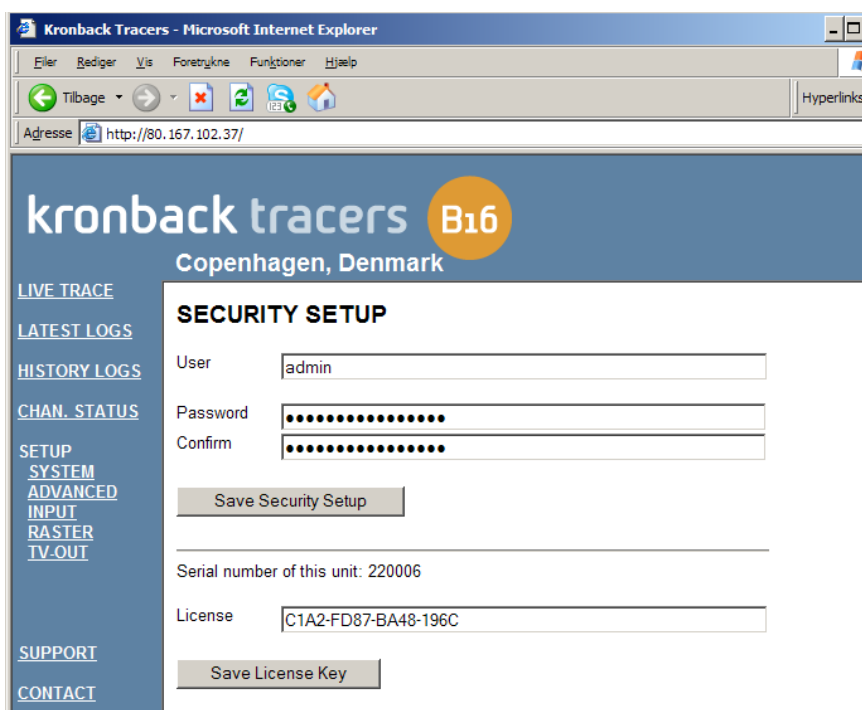
If the SMTP mail server is not available or if the **B16** is disconnected from the network a 5 minutes timer starts. After the 5 minutes the **B16** tries to reconnect. This process continues until the network connection is re-established.

During the 5 minutes up to 50 E-mails will be buffered. This buffer is cyclical, so the oldest E-mails are deleted. This means that only the 50 latest alarms will be sent when the network connection or the mail server is again accessible.

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3.11. Security setup



From the security page user credentials and License Key can be entered.

3.11.1. credentials

The B16 has only a single user profile. This profile is used to ensure that only approved users can enter the **SETUP→ADVANCED** menu. The username and password is sent unencrypted over the IP network.

3.11.2. Advanced authentication

For more advanced user access with individual credentials and profiles it is recommended to use a third party authentication system.

Please contact Kronback Tracers support for further information on authentication and secure access.

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3.11.3. Username

Enter the username that should be used to access the **SETUP→ADVANCED** menu.

3.11.4. Password

Enter the password that should be used to access the **SETUP→ADVANCED** menu. The Password must be re-entered in the Confirm field under the password field.

The password is also used as verification if **HISTORY LOG** files are deleted.

There remain no restrictions to the format of the username and password. It could even be empty. It is however always required to re-enter the password when saving the security setup.

In case that the username or password is lost, the username can be obtained from the console interface of the **B16**. The password can however not be verified from the console interface but can only be re-entered.

3.11.5. License key

The license field presents the current license key that is entered in the system. New license keys can be entered for expansion of the **B16** inputs or activation of software options.

3.11.6. Activating inputs

As standard the **B16** is available with only 1 active input port and additional inputs can be activated by updating the license key. All input-related menus in the **B16** are reflecting the number of activated input ports.

The **B16** port expansion are divided in two ranges. First range is activation of input 1 to 16. This activation is done in steps of 1, and gives the possibility to configure the **B16** with ex. 1 or 4 or 13 inputs. Second range is when all 16 inputs are activated. Above **16** activated inputs no further input restrictions exists, and the number of inputs defined in the **B16** system are only dependant on the number of external switches that are configured in the **SETUP→ADVANCED→SWITCH** menu.

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3.11.7. Example: B16 configured with 5 inputs

CHANNEL STATUS Next update in: 3 seconds

RASTER										
1	2	3	4	5	6	7	8	9	10	CD
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

1 returnpath1
2 returnpath2
3 returnpath3
4 returnpath4
5 reference signal 71.1dBuV

INPUT SETUP

Nr.	Description	Sensitivity	Ref. level	Intensity Graph
1	returnpath1	20-80	68	<input checked="" type="checkbox"/>
2	returnpath2	20-80	69	<input checked="" type="checkbox"/>
3	returnpath3	20-80	70	<input checked="" type="checkbox"/>
4	returnpath4	20-80	71	<input checked="" type="checkbox"/>
5	reference signal 71.1dBuV	20-80	71	<input checked="" type="checkbox"/>

Save Input Setup

TV-OUT SETUP

Please select the input to show on the TV output and choose if the TV switch should be On or Off.

TV Switch

- 1: returnpath1
- 2: returnpath2
- 3: returnpath3
- 4: returnpath4
- 5: reference signal 71.1dBuV
- Reference

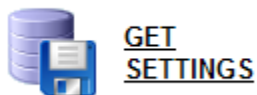
3.11.8. Activating options

The license key field also activates software features of the **B16**. Currently one option exists, but up to 8 option can be activated.

Option	Activated feature
1	Java Mobile telephone access
2	future
3	future
4	future
5	future
6	future
7	future
8	future

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3.12. Get settings:



3.12.1. Saving settings

Saves the current user configuration of the **B16**.
This configuration should be saved each time major change to the **B16** configuration has been made.

The file that is saved is named **active_params.xml**
Re-entering the backed up information to the B16 system requires support from kronback tracers.

3.12.2. Settings not saved

The following settings are not saved in the active_params.xml file:

- NTP server setting
- Network parameters.
- SMTP server settings
- License key
- TV-OUT** descriptive text

3.13. Input setup

kronback tracers B16
Copenhagen, Denmark

INPUT SETUP

Nr.	Description	Sensitivity	Ref. level	Intensity Graph
1	returnpath1	20-80	68	<input checked="" type="checkbox"/>
2	returnpath2	20-80	69	<input checked="" type="checkbox"/>
3	returnpath3	20-80	70	<input checked="" type="checkbox"/>
4	returnpath4	20-80	71	<input checked="" type="checkbox"/>
5	reference signal 71.1dBuV	20-80	71	<input checked="" type="checkbox"/>
6		10-70	70	<input type="checkbox"/>
7		10-70	70	<input type="checkbox"/>
8		10-70	70	<input type="checkbox"/>
9		10-70	70	<input type="checkbox"/>
10		10-70	70	<input type="checkbox"/>
11		10-70	70	<input type="checkbox"/>
12		10-70	70	<input type="checkbox"/>
13		10-70	70	<input type="checkbox"/>
14		10-70	70	<input type="checkbox"/>
15		10-70	70	<input type="checkbox"/>
16		10-70	70	<input type="checkbox"/>

Save Input Setup

3.13.1. Description

The Input setup page allows entry of descriptive names for each input channel. Up to 50 characters can be entered. National specific characters are fully allowed.

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3.13.2. Sensitivity

The sensitivity field is used to configure the input step attenuator of the **B16**. This attenuator has 4 ranges that consist of a low and high value.

3.13.3. Low value

The low value of each range shows the guaranteed maximum noise-floor of **B16**, indicating that signals over this level are present on the input.

3.13.4. High value

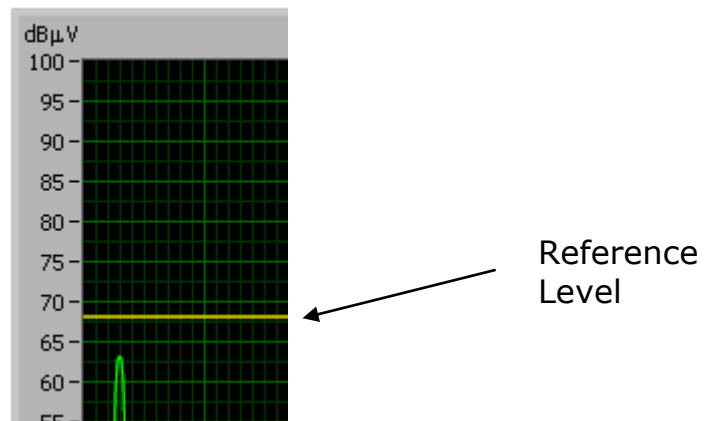
The high value presents the minimum guaranteed level before the **B16** reaches the clipping state. The absolute maximum rating before the B16 input stage is overloaded is normally 1-2 dB higher. Note that the maximum level is specified at 1 constant wave (CW). If more than one CW are present the max input level should be decreased, see table

Range [dBuV]	Attenuation [dB]	B16 noise floor [dBuV]	Max input level [dBuV@1CW]	Max input level [dBuV@2CW]	Max input level [dBuV@10CW]
10-70	0	<10	>70	>64	>50
20-80	10	<20	>80	>74	>60
30-90	20	<30	>90	>84	>70
40-100	30	<40	>100	>94	>80

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3.13.5. Ref level.

This level is used throughout the **B16** system as the 0dB reference level for all C/N measurements. The ref level should be set to the same level that the Cable modems peak level. A graphic representation of this level is shown in the **LIVE TRACE** menu, as the yellow line.

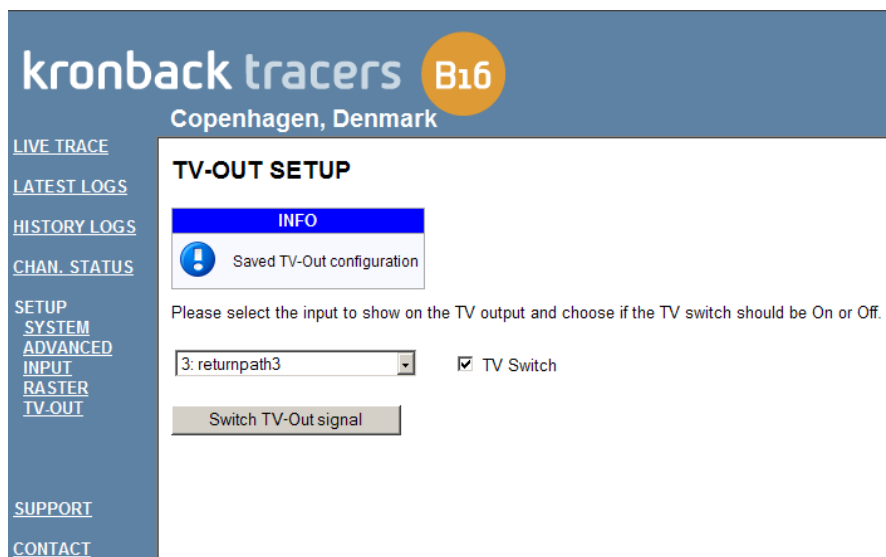


3.13.6. Intensity graph

When checked the intensity graph field activates the cyclic scanning of the specific input. The input is scanned each 9 seconds and the **HISTORY LOG** and **LATEST LOG** are updated. After 1,5 hours the first **LATEST LOG** graph will be available, and after 24 hours the first entry in the **HISTORY LOG** will be available.

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3.14. TV-OUT



The settings on the **TV OUT** page decide which of the **B16** input signal that should be presented on the **video out** connector on the **B16** front panel.

3.14.1. TV-switch checked

When the TV-switch field is checked the **video output** will show the selected input trace. Also the **RF-switch** on the **B16** front is activated, and will pass the signal present on the input F-connector to the output F connector. The red LED over the **RF-switch** is lighting

3.14.2. TV-switch unchecked

When the TV-switch field is un-checked the video output will still be present, but no trace is displayed. The **RF-switch** is disconnected, and the red LED over the **RF-switch** is turned off.

3.14.3. RF switch

The Video output should be modulated and up-converted before it is entered into the **RF-switch**.

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The intention of the **RF-switch** is to disconnect the modulated video-carrier from the network, to ensure that the **TV OUT** of the **B16** is only present in the CATV network when necessary.

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4. Console interface

```

KRONBACK TRACERS
B16 Configuration tool, version 2.01

[I]P address      : 192.168.205.10
  subnet         : 255.255.255.0
  gateway        : 192.168.205.1
[D]NS dhcp active : no
  primary
  secondary
  hostname       : B16
  domain
[L]ink speed     : auto
[A]dmin user     : admin

[U] Undo changes.
[R] Reboot without saving.
[W] Write changes and reboot.

Command:

```

The **B16** is configured from the frontpanel using the RS232 connector marked **CONSOLE**.

4.1.1. RS232 parameters

RS232 parameter	Value
Baud rate	9600 bos
Databits	8
Parity	None
Stop bit	1
Flow control	None

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4.1.2. Console Cable

The Console interface is accessed using a Kronback tracers blue console cable marked "Kronback Tracers x16 console cable"

The pinout of kronback tracers x16 console cable is:

B16 RJ45 pin	direction	PC RS232 dsub9 female	Function
3	→	2	B16 data TX
4		5	ground
5		5	ground
6	←	3	B16 data RX
7		5	ground
8		5	ground

4.1.3. Using the console interface

The following commands are available from the console interface:

- I configures basic network parameters
- D Configures extended network parameters
- L Sets the Physical speed of the RJ45 network connection
- A Configures the **B16** username and password.

Changes can be committed or discarded using

- U discards the changes configured and leaves the B16 as before the changes
- R Reboots the B16 without committing changes
- W Reboots the B16 and commits the changes that were entered.

Note within the console interface use the key [del] to correct entries. Do not use the backspace key.

Default entries are shown in [brackets], and can be accepted by pressing enter. IP addresses are verified by the console interface. Entering incorrect format will force the user to retype.

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4.1.4. Command I: IP settings

```

Command: i
Use DHCP [yN]:
Enter the new IP address [192.168.205.10] :
Enter the new subnet mask [255.255.255.0] :
Enter the new gateway ip [192.168.205.1] :

```

If DHCP is not entered the **B16** asks for IP address, subnet mask and gateway IP address.

If DHCP is accepted, the address, subnet and gateway is presenting the IP settings that was assigned by the DHCP server after the B16 is rebooted.

IP settings can also be configured from the menu **SETUP→ADVANCED→NETWORK**

4.1.5. Command D, Extended network parameters

```

Command: D
Hostname [B16] :
Domain_name [kronback.com] :
Primary DNS server ip [10.10.10.1] :
Secondary DNS server ip [10.10.10.2] :

```

Hostname name, domain name and DNS settings can also be configured from the menu **SETUP→ADVANCED→NETWORK**

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4.1.6. Command L, Link speed

```

Command: L
[0] auto
[1] 10 Mbit, half duplex
[2] 10 Mbit, full duplex
[3] 100 Mbit, half duplex
[4] 100 Mbit, full duplex
Select mode : :_

```

4.1.7. Command A, Username and password configuration

```

Command: A
Username [admin] :admin
Password :1234
Retype password :1234_

```

The present username is displayed in brackets.
Password must be entered twice.

Note that the present password of the **B16** is not displayed. The password must always be re-entered.